

OPINIONS ON CONTESTED INFRASTRUCTURES

WHAT IS IT?

This ABM simulates opinions on a topic (originally contested infrastructures) through the interactions between paired agents and based on the sociopsychological assumptions of social judgment theory (SJT; Sherif & Hovland, 1961). The model shows the opinion dynamics of individuals and the whole agent population regarding a specific issue over time. The model is based on empirical data (raw data not included in the model).

HOW IT WORKS

The argument values A_x for every agent i assumes values between $[-1, 1]$ and are computed as the product of valence $V_x [-1, 1]$ and importance $I_x [0, 1]$ for each argument (taken from empirical data).

$$A_x = V_x * I_x$$

For all three arguments, each agent profile includes the information about the location of the respective arguments on the individual's opinion structure based on the latitudes described in the SJT (taken from empirical data). One time step t in the simulation represented one interaction between all pairs of agents. The paired agents are randomly chosen from the social network.

The 841 agents are located on a 29×29 grid with wrapped boundaries.

Each agent randomly chooses a neighbor in its social network and starts to interact. The interaction is one-directional. The adaptation depends on where the compared argument is located on the agent's social judgment continuum (i.e., in which of the three latitudes) and whether the values of the compared arguments A_{xa} and A_{xb} have the same or opposite directions (i.e., positive or negative).

During the interaction, the interacting agent sequentially chooses one of the arguments x and checks which of its latitudes the argument belonged to.

If the chosen argument is in the latitude of non-commitment, no adaptation occurred. The argument value A_{xa} of the interacting agent stays the same. Then the interacting agent moves on and sequentially selects the next argument.

If the argument belongs to the latitude of rejection or acceptance, then an adaptation occurs. The quadratic term in the function has been chosen to best represent the two effects of contrast and assimilation described in the SJT. The speed of change in the values of the arguments for each agent is regulated by the constant s set at $s = 0.01$.

Generally, when adaptation occurs, the values of A_x would be permitted to shift up (down) to a maximum (minimum) of 1 (-1).

HOW TO USE IT

Push "setup" for initializing the agents in the model. For this step, an import of empirical data is needed.

Push "show data" after the setup procedure to show the graphs in the interface.

Select the “pause” slider for stopping the interaction after a given amount of ticks (“stop-value”-slider).

THINGS TO NOTICE

As this model is based on collected empirical data, the input data is not made available for this purpose. However, one can easily create a distribution of values (i.e., valence, importance, latitudes) for trying the model and to experiment with it.

EXTENDING THE MODEL

More arguments can be added, as well as new interaction processes (i.e., learning, new arguments, etc...)

CREDITS AND REFERENCES

Stefanelli, A. & Seidl, R., Opinions on contested energy infrastructures: An empirically based simulation approach, *Journal of Environmental Psychology* (2016), doi:10.1016/j.jenvp.2016.06.003